Oral Testimony to Senate
Senate Commerce Subcommittee on Technology, Innovation and Competitiveness
Hearing on Manufacturing Competitiveness in a High Tech Era

June 8, 2005

G. Wayne Clough
President, Georgia Institute of Technology

Chairman Ensign, I appreciate this opportunity to make a presentation to this committee on what is a very important topic to our nation. The ability of our high technology manufacturing sector to compete in the rapidly evolving world economy is linked to the broader issues of competitiveness of our businesses and industries at large. Manufacturing is a special case within this larger context where all of our businesses will have to be willing to compete in a landscape changed as other nations target our technology-based economic sector with greater vigor and resources than ever before.

I have been fortunate to serve in leadership positions in a number of national and regional efforts that seek to shape our nation's competitive posture for the future. These include serving as co-chair of the National Innovation Initiative of the U.S. Council on Competitiveness, chair of the Engineer of 2020 project for the National Academy of Engineering, and participating as a member of the President's Council of Advisors on Science and Technology and as a member of the National Science Board. I also have the good fortune to be president of the Georgia Institute of Technology, which has a top rated manufacturing research and education program, and operates a state-wide entity in Georgia that manages the state's high tech incubator and fifteen technology transfer offices around the state that assist local manufacturing companies. Our activities range from manufacturing applications from new fields like nanotechnology and to those found in traditional fields like pulp and paper and food processing. This experience has provided me the opportunity to consider where manufacturing is going, what opportunities exist for maintaining jobs and creating new jobs, and what lies over the horizon so we can prepare for the future.

We all are aware of the issues facing manufacturing in terms of growing global competition, particularly from nations where their wages are significantly lower than ours. We are also learning to appreciate that as we improve productivity in a mature manufacturing sector, this can led to a decline in employment although the business remains successful. In these circumstances the key to employment lies in a combination approach that seeks to keep at least the high-end jobs as productivity is increased, creates new manufacturing sectors or value propositions and with them new jobs, and creates jobs related to service and support for the manufacturing sector.

Every three or four years, Georgia Tech conducts a detailed survey of the manufacturers in Georgia. What we have learned is that manufacturing companies that are doing well share the following characteristics:

1. Exhibit a willingness to adapt and improve customer focus and value added services.
2. Work on new product development.

3. Have a record of filing patent applications.
4. Sustain innovation as part of the company culture.
5. Effectively utilize upgraded computing in manufacturing operations and business transactions.
6. Have access to information resources and assistance in training employees.

These characteristics are likely to become more, not less important in the future. They allow companies to compete even in the face of lower wages in other countries. Because small- to medium-sized manufacturers are often unable to afford some of the technical advice they need to innovate, initiatives like the federally funded Manufacturing Extension Program are needed to help them stay competitive.

The National Innovation Initiative highlights other areas that are important to the future health of our manufacturing sector, including:

1. Balanced federal funding for R&D in areas like engineering and the physical sciences to help create the ideas that will form the basis for new products and businesses. These areas have seen federal research funding remain flat or decline in the past decade. If we are to capitalize on new developments in fields like nanotechnology, MEMS and biotechnology, these trends have to be reversed.
2. Initiatives to encourage U.S. students to major in engineering and sciences and address workforce needs for manufacturing. Our graduation numbers in these fields peaked in the 1980's and have never recovered. We are now being out-produced in graduates in engineering and science by China, India, and the European Union, and the gap will continue to grow if there is no intervention. In addition, international student interest in study in this country, an old staple we could rely on in the past, has declined precipitously in the past two years.
3. Programs for workforce training and support for transportable benefits for workers who are displaced by changes in technology. The advance of technology is proceeding at such a pace, workers need their skills upgraded on a regular basis, and some will see their jobs disappear altogether.
4. Educational programs in universities and colleges that emphasize innovation to help graduates understand how to create and sustain an innovative culture.

Other recommendations are included in the NII report published at our December 2004 summit. Since that time, 200,000 downloads of the report have been made. The Council is now into an implementation phase for its recommendations, and we are enlisting many allies in the cause, including the National Association of Manufacturers. Regional meetings are going to be held on developing local innovation strategies, and a national conference on innovation and manufacturing will be held in October in conjunction with the Business Roundtable, NAM, the AEA and the Council. The Departments of Commerce, Labor and Energy, and businesses like IBM are also taking on pieces of the NII strategy to help drive it forward. The use of a public private partnership approach is believed the best way to succeed.

In summary, the future for manufacturing in high tech industries is not going to be secured by doing things in the same old way. Competition for high tech manufacturing is increasing rapidly as nations like China, India, and Korea build and invest in their educational and R&D programs.

To succeed we need to sharpen and support a national strategy for innovation that will allow us to maintain our share of this important segment of the world economy.